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The United Nations System of National Accounts:
An Introduction

The United Nations System of National Accounts (SNA) is not widely known in the United States. However, interest is growing. Early this year, a working group on improving economic statistics, chaired by the Chairman of the Council of Economic Advisers and including the Commerce Department's Under Secretary for Economic Affairs, recommended that the United States move to the SNA, and the BEA budget now before Congress requests funds for such a move by the mid-1990's.

The SNA provides a more comprehensive, integrated picture of the economy than the present U.S. economic accounts. In particular, it integrates the recording of the economy's stocks and flows, both financial and nonfinancial. Thus it provides a better analytical base for policy. Most other countries follow the SNA, adapting it to fit their economies and statistical systems; were the United States following the SNA, U.S. measures of economic growth, inflation, the saving rate, and other key policy variables would be more comparable with those from other countries. Because policy is increasingly formulated in an international setting, comparability across countries is becoming even more important. The SNA is currently being revised to reflect advances in economic accounting in the last 20 years and the emergence of new economic institutions and policy concerns, and thus a move by the United States to the SNA over the next few years would be opportune.

This article introduces the SNA. The first part of the article describes the SNA as a system, comparing and contrasting it with the U.S. economic accounts in very general terms. The second part presents estimates prepared by BEA, based on a set of reconciling adjustments, that approximate some of the major aggregates of the SNA. Although this part focuses on differences, the many similarities in coverage and presentation between BEA's national income and product accounts and the corresponding part of the SNA are noteworthy. The third part describes the revision of the SNA that is currently under way.

Part 1. The SNA as a System

THE origins of the System of National Accounts (SNA) can be traced back to some of the same theoretical developments and economic conditions that helped shape the U.S. accounts during the 1930's and early 1940's. The first SNA was drafted by a group of experts from various countries (including the United States) under the auspices of the United Nations and was adopted by the U.N. Statistical Commission in 1953. The 1953 SNA drew on work in a number of countries and by the predecessor of the Organisation for Economic Co-operation and Development. A central feature was that it placed national income and product totals, which at one time had been the center of interest, in an integrated system of economic transactions. This system was similar to the five-account summary of the U.S. national income and product accounts (NIPA's). Like the U.S. accounts, it defined the economy essentially in terms of market transactions, and it presented consumption, investment, and saving measures in addition to the income and product totals. A revision of the SNA in 1968 substantially extended the U.N. system to include input-output accounts, flow of funds accounts, and balance sheets.[1]

The SNA has had two main goals: To facilitate international comparisons and to serve as a guide to countries as they develop their own economic accounting systems. Most countries with market economies use the SNA as a guide. By doing so, they take advantage of the substantial body of experience that the SNA represents and increase the comparability of their estimates with those of other countries. The European Communities adopted a version of the SNA to be followed by its member countries beginning in 1970. Canada, which—along with the United Kingdom—cooperated with the United States in developing national income and product accounts during World War II, follows the broad outline of the SNA. Japan and Australia moved to the SNA after the 1968 revision. Until recently, countries with centrally planned economies followed the System of Balances of the National Economy, also called the material product system, or MPS. (This system was developed by an economic organization of which these countries are members to accord with the theory on which their economies are based, and it is used by the United Nations to report information from them.) Consistent with their transition to market-oriented economies, the Soviet Union and a number of the others either are preparing accounts on both an SNA basis and on an MPS basis or are moving to the SNA.

The SNA aims to record all the stocks and flows that are defined as part of the economy. Like other sets of economic accounts, it does so by grouping transactors and transactions in a way that is meaningful for economic analysis, forecasting, and policy.[2]

For transactors, the SNA groups households, governments, and business enterprises (financial and nonfinancial) into sectors (table 1). However, some transactors

NOTE.—Carol S. Carson, who is participating in the revision of the SNA, wrote the first and third parts of the article. Jeanette Honsa prepared the SNA-basis estimates and wrote the second part of the article.

1. The publication following that revision, often referred to as the "Blue Book," can be taken as representing the present SNA; see United Nations, *A System of National Accounts,* Studies in Methods, Series F, No. 2, Rev. 3 (New York: United Nations, 1968). A subsequent publication rounded out the guidelines on balance sheets; see United Nations, *Provisional International Guidelines on the National and Sectoral Balance-Sheet and Reconciliation Accounts of the System of National Accounts,* Statistical Papers, Series M, No. 60 (New York: United Nations, 1977). A useful overview of the present SNA is in *National Accounts Statistics: Main Aggregates and Detail Tables, 1986;* see the box "International Estimates of GNP and GDP."

2. For a discussion of the principles of economic accounting with particular reference to the United States, see "An Introduction to National Economic Accounting" in the March 1985 SURVEY OF CURRENT BUSINESS. This article, by Allan H. Young and Helen Stone Tice, is reprinted as Methodology Paper Series MP-1 (Washington, DC: U.S. Government Printing Office, 1985).

are not easily grouped because they have characteristics of more than one of these sectors. The SNA deals with these transactors either by treating them as a separate sector or by combining them with one or more of the other sectors. Private nonprofit institutions serving households are grouped into a separate sector. Some unincorporated enterprises are in the business enterprise sector, and the others are in the household sector. Foreigners, to the extent that they have transactions with residents, are treated like a sector, called the rest of the world. In addition, the SNA groups producing establishments into industries (or the equivalent).

The SNA groups transactions according to the major categories of economic activity—production, income and outlay, capital accumulation, and capital finance. The transactions—often referred to as "flows"—are supplemented by revaluations for price change; together the flows and revaluations "explain" the differences between the opening and closing balance sheets, which record the stocks of assets and liabilities at a point in time (table 2).

Each group of flows and the stocks are arranged in a two-sided account in which the totals balance either by definition or by inclusion of a balancing item. When the transaction (and associated stock) accounts are set up for each transactor group, the result is a set of macroeconomic accounts for the Nation and for the several sectors (and industries). The SNA aggregates—such as gross product, saving, and national wealth—are usually a total for an account or a balancing item. Although the derivation of aggregates is not the main purpose of the SNA, the ag-gregates are useful summary indicators for analysis and comparisons over time and space.

The accounts for the Nation and sectors are supplemented in several ways. A set of tables provides for recording additional information—either detail not easily shown in account form or information related, but not integral, to the accounts. Standard classifications are indicated for industries, the functions of government, household expenditure on goods and services, capital formation, etc. Finally, guidelines are provided for constant-price measures.

Thus, the SNA provides a comprehensive framework: It includes measures of production, income, saving and investment, and wealth; it encompasses both domestic and foreign activities; it links financial and nonfinancial transactions; and it provides for both current and constant-price measures. Further, the SNA is an integrated system—that is, the several subsets of accounts use consistent definitions, classifications, and accounting conventions (valuation, time of recording, extent of consolidation, extent of netting, etc.).[3]

The SNA includes accounts that are separate systems in the United States. The NIPA's, prepared by BEA, cover the transactions that are grouped in the SNA as production, income and outlay, and capital accumulation. The input-output accounts, also prepared by BEA, cover the production accounts by industry. The flow of finds accounts, prepared by the Federal Reserve Board, cover the financial transactions. Finally, the Federal Reserve Board also prepares revaluation accounts and balance sheets, but they only cover the private domestic sectors. (The SNA does not include balance of payments accounts, but the SNA's rest-of-the-world transactions and the International Monetary Fund's balance of payments guidelines have moved closer together.)

Compared with the U.S. economic accounts, the SNA is more comprehensive in coverage. The U.S. accounts do not include a complete set of either revaluation accounts or of balance sheets. In addition, the SNA is more fully integrated. For the U.S. accounts, the NIPA's and input-output accounts are integrated conceptually and statistically. The NIPA's and BEA's balance of payments accounts differ conceptually and statistically, but they are reconciled by a few regularly published items. The NIPA's and the flow of funds accounts also differ conceptually and statistically; they are not fully reconcilable.

The SNA's definitions, classifications, accounting structure, and accounting conventions differ to some extent from those used in the U.S. accounts. With regard to the sector definitions, the SNA includes some unincorporated enterprises in the household sector and treats nonprofit institutions serving households as a separate sector; the U.S. accounts include all unincorporated enterprises in the business sector and include the nonprofits in the household sector. With regard to accounting structure and conventions, the SNA details the sector accounts more fully. The SNA presents a set of production, income and outlay, and capital accumulation accounts for each sector; the usual NIPA presentation of these accounts is more consolidated, although the separate sector accounts can be derived. The NIPA's five-account summary presents, for example, a pro-

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Table 1.—SNA Grouping of Transactors into Sectors

I. Nonfinancial enterprises, corporate and quasi-corporate
    A. Private
        1. Corporations
        2. Unincorporated units owned by nonresidents
        3. Large partnerships and sole proprietorships with complete accounts
        4. Nonprofit institutions mainly sewing business
    B. Public
        1. Public corporations
        2. Large unincorporated units that sell mostly to the public

II. Financial institutions
    A. Central bank
    B. Other monetary institutions
    C. Insurance companies and funded pension funds that are not part of public social security schemes and that engage in capital market transactions
    D. Other financial institutions

III. General government— all public agencies not elsewhere classified (bodies carrying out the usual functions of government and providing services free or at less than cost; nonprofit institutions controlled by or financed (at least mainly) by public authorities or serving government; social security arrangements for large sections of community; unincorporated public units that produce mainly for government or sell to the public on a small scale; lending and saving bodies that are financially integrated with government or lack authority for independent market activity)
    A. Central government
    B. State and local government
    C. Social security funds

IV. Private nonprofit institutions serving households—institutions not financed (at least mainly) or controlled by government, employing the equivalent of two or more persons, and furnishing services free or at less than cost

V. Households—resident households plus unincorporated enterprises not in I and private nonprofit institutions not in IV

VI. Rest of the world [1]

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1. Treated as a sector.
SNA System of National Accounts

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3. In fact, the integration is not yet complete, partly because several unforeseen problems were encountered in developing guidelines for balance sheets in the decade following the publication of the guidelines for the flows.

<div align="center">Table 2.—SNA Grouping of Stocks and Flows into Accounts</div>

Account	Key aggregates	Coverage
Balance sheet, opening............................	National wealth, net worth........................	Accounts for the Nation and the sectors show assets (financial, tangible, and nonfinancial intangible), liabilities, and net worth.
Production..	GDP, value added	A consolidated account for the Nation shows GDP as the total of the income and expenditure components. Accounts for the sectors and industries show output (sales, etc.), intermediate consumption, and value added (compensation of employees, operating surplus, etc.).
Income and outlay	National disposable income, saving	A consolidated account for the Nation shows disposable income as the total. Accounts for the sectors show the forms in which income is received (compensation of employees, operating surplus, property and entrepreneurial income, and current transfers), disbursements (final consumption expenditures, property income, current transfers, etc.), and saving.
Capital accumulation	Capital formation............	A consolidated account for the Nation shows saving, capital transfers to foreigners, and capital formation. Accounts for the sectors show finance of accumulation (saving and capital transfers) and accumulation (capital formation, purchases of land, purchases of nonfinancial intangible assets, capital transfers, and net lending).
Capital finance...	Net lending ....……	Accounts for the Nation and the sectors show acquisition of financial assets (deposits, securities, loans, etc.), **incurrence** of liabilities (deposits, securities, loans, etc.), and net lending.
Revaluation	Holding gain or loss................................	Accounts for the Nation and the sectors show changes in the value of assets and liabilities as a result of price changes (and some reconciliation items, such as for unforeseen events and for new finds less depletion of natural resources).
Balance sheet, closing..............	National wealth, net worth........................	Accounts for the Nation and the sectors show assets (financial, tangible, and nonfinancial intangible), liabilities, and net worth.

NOTE.—This presentation is a stylized summary based on the SNA standard accounts and supporting tables.
GDP Gross domestic product
SNA System of National Accounts

duction account that is consolidated for all sectors combined with the income and outlay account for the business sector.

These differences and others that will be discussed in part 2 exist for several reasons. Some arise because the U.S. system has been constructed to fit the U.S. economy and to use the data that are, or could reasonably be, available, whereas the SNA is meant to be a universal system without compromises to fit specific national situations. Some of these differences exist even for countries that follow the SNA. Some other differences are with respect to economic accounting issues that are generally agreed to have no "correct" answer (and where concern for international comparability of economic measures might tip the balance toward the SNA answer).

Part 2.
BEA's Estimates of SNA Aggregates

This part of the article focuses on the subset of SNA accounts that corresponds to the NIPA's. In doing so, it moves the comparison and contrast of the SNA and the U.S. accounts from the general to the specific. This part serves two purposes. Pragmatically, it explains how the estimates of major U.S. aggregates on an SNA basis published by the international organizations are reconciled with the NIPA estimates published by BEA. (See the accompanying box for references to publications that present U.S. estimates on an SNA basis.) More generally, in explaining the reconciliations, it introduces several economic accounting issues, some of which are mentioned again in discussing the revision of the SNA.

The SNA-basis estimates described in this part are prepared by BEA in response to a questionnaire used by the United Nations and the Organisation for Economic Co-operation and Development.[4] The annual estimates prepared for this purpose are conversions of the published NIPA estimates to the SNA basis by a series of reconciling adjustments based on underlying detail and related data.[5]

The adjustments are not able to deal with all differences. In particular, adjustments cannot be made when the information needed to quantify a definitional or classificational difference is not currently available. For example, information is not available to adjust inventories to exclude the kinds of livestock—breeding stock, dairy cattle, animals raised for wool, etc.—that are treated in the SNA as fixed capital formation. In addition, some of the adjustments only roughly approximate the SNA definition or classification. Further, the adjustments do not deal with some other differences, such as those related to valuation. For example, the SNA records merchandise exports on a "free on board," or f.o.b., basis and imports on a "cost, insurance,

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4. The questionnaire for 1988, the most recent year for which it is available, consisted of 66 tables. The United States, like most countries, supplied considerably less than the full set. The United States submitted 49 tables; 41 were derived from the NIPA's, and 8 were derived from the Federal Reserve Board's flow of funds accounts.

5. A standard package of computer listings showing the conversion of annual NIPA estimates into 10 of the major SNA tables is available from BEA. The cost is $25. New listings are usually available in December, covering the same 4 years as the NIPA estimates published the preceding July. Orders, accompanied by a check or money order payable to Economic and Statistical Analysis/BEA, should be addressed to the National Income and Wealth Division, BE-54, Bureau of Economic Analysis, U.S. Department of Commerce, Washington, DC 20230. Custom computer listings, detailing other years (1960-88) or other SNA tables, are available at cost; for more information, write the same address or call (202) 523-0669.

and freight," or c.i.f., basis (with additional f.o.b. information); because of data limitations, BEA records exports and imports on a "free alongside ship," or f.a.s., basis.

Tables 3 and 4 show how the adjustments affect expenditures on gross domestic product (GDP) and charges against GDP, respectively. For 1988, the latest year for which there is a reconciliation, SNA-basis GDP is about three-fourths of 1 percent less than NIPA-basis GDP; prior to 1986, the two GDP measures differed by less. These tables also show some of the differences in magnitudes of the major components and introduce some of the differences in terminology between the two systems.

The discussion that follows will deal with (1) the principal measure of production in each system; (2) three differences between the NIPA's and the SNA that cause differences in total GDP; (3) some differences that cause NIPA components to differ from their SNA counterparts but that do not affect total GDP; (4) differences in types of income and in saving; and (5) differences in presentation.

Principal measure of production

Gross national product (GNP) is the principal measure of aggregate production in the NIPA's; GDP is the principal measure in the SNA. The NIPA's focus on GNP, but they show GDP as a subtotal in a table that presents product by sector. The SNA includes only GDP, but the U.N. publications show GNP in a reconciliation of commonly used aggregates.

Gross *national* product is the market value of goods and services produced by labor and property supplied by residents of a country, regardless of whether or not that labor and property is located within the geographical confines of the country. Gross *domestic* product is the market value of goods and services produced by labor and property located within the geographical confines of the country, regardless of the residence of that labor and property. The difference between the two measures is net factor income received from abroad, which is included in GNP but not in GDP (table 5). Net factor income received from abroad is the difference between factor income earned abroad by U.S. residents, on the one hand, and factor income earned in the United States by foreign residents, on the other; it can,

therefore, be either positive or negative.[6] GDP is usually thought to be preferable for analyzing production and employment, for example, because these variables may need to be related to a geographic area. GNP may be preferable for analyzing the sources and disposition of income, because receipts from and payments to the rest of the world may be relevant parts of the total picture.

For the United States, annual growth rates of GNP and GDP differ by less than one-half percentage point because net factor income received from abroad is small compared with the rest of the economy. For other countries, however, the two measures can be quite different. For countries that have had much more investment from abroad than they have invested abroad, GDP can be significantly higher than GNP. For countries that have a sizable number of residents who work abroad, GNP can be noticeably higher than GDP.

Differences that affect GDP

Government nonmilitary structures and equipment, imputed charges for certain financial services, and Federal Government pensions affect GDP differently in the NIPA's than in the SNA. As illustrated in table 5, the treatment of the first and third of these items has tended to make GDP higher in the SNA than in the NIPA's in recent years, but this tendency has been more than offset by the treatment of the second item.

Government nonmilitary structures and equipment.—The NIPA's do not distinguish between government purchases on current account (that is, "consumption") and government purchases on capital account (that is, "investment"); all government purchases are treated as current-account purchases. The SNA does make this distinction. Purchases of nonmilitary structures and equipment are assigned to the

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6. Net factor income from abroad on the SNA basis differs from that on the NIPA basis: (1) SNA-basis factor incomes do not include reinvested earnings of direct investors and (2) SNA-basis factor incomes do not include imputed interest (see the section on the imputation for financial services).

Table 3.—Expenditures on GDP, NIPA and SNA, 1988

Billions of dollars]

NIPA		SNA	
Personal consumption expenditures...............	3,235.1	3,202.0	Private final consumption expenditure
Gross private domestic investment...............	750.3	839.0	Gross capital formation
Change in business inventories	30.6	15.8	Increase in stocks
Fixed investment	719.6	823.2	Gross fixed capital formation
Government purchases of goods and services.	968.9	883.7	Government final consumption expenditure
Net exports of goods and services [1].............	-107.0		
Exports [1]..	430.9	424.0	Exports of goods and services [1]
Imports [1]..	537.9	537.9	Less: Imports of goods and services [1]
GDP..	4,847.3	4,810.8	GDP

1. In GDP, exports and imports exclude factor income.

NOTE.—SNA GDP and exports of goods and services are $7.0 billion lower than submited to the international organizations. The difference is a correction to the treatment of imputed exports of services of financial institutions.

GDP Gross domestic product
NIPA National income and product accounts
SNA System of National Accounts

Table 4.—Charges Against GDP, NIPA and SNA, 1988

Billions of dollars]

NIPA		SNA		
Compensation of employees [1]	2,907.7	2,922.4		Compensation of employees [1]
Business transfer payments............................	29.0	944.7		Operating surplus [1 2]
Corporate profits with IVA and CCAdj.....	285.0	440.2		Corporate and quasi-corporate enterprises
Proprietors' income with IVA and CCAdj...	327.8	504.5		Private unincorporated enterprises
Rental income of persons with CCAdj	15.7			
Net interest [1]	403.2			
Indirect business tax and nontax liability	393.5	363.9		Indirect taxes, net
		393.5		Indirect taxes
		29.6		Less: Subsidies
Less: Subsidies less current surplus of government enterprises.	18.5			
Capital consumption allowances with CCAdj.	513.6	589.4		Consumption of fixed capital
Statistical discrepancy	–9.6	-9.6		Statistical discrepancy
Charges against GDP	4,847.3	4,810.8		Charges against GDP

1. In GDP, factor incomes exclude net payments to rest of the world.
2. In the SNA, the operating surplus includes the IVA and CCAdj.

NOTE.—SNA GDP and operating surplus of corporate and quasi-corporate enterprises **are** $7.0 billion lower than submitted to the international organizations. The difference is the result of a correction to the treatment of imputed exports of services of financial institutions.

CCAdj Capital consumption adjustment
GDP Gross domestic product
IVA Inventory valuation adjustment
NIPA National income and product accounts
SNA System of **National** Accounts

Table 5.—Reconciliation of NIPA GNP to SNA GDP, 1988

[Billions of dollars]

GNP, NIPA	4,880.6
Less: Net factor income from the rest of the world	33.3
Equals: GDP, NIPA	4,847.3
Plus: Services of nonmilitary government structures and equipment—capital consumption allowances with CCAdj	57.5
Less: Imputed financial service charges	104.0
Plus: Federal Government pensions	10.0
Equals: GDP, SNA	4,810.8

CCAdj Capital consumption adjustment
GDP Gross domestic product
GNP Gross national product
NIPA National income and product accounts
SNA System of National Accounts

capital account (and included in gross capital formation). The rationale is that these items yield useful services for much longer than a single accounting period, and their purchase cannot, therefore, be regarded as a current cost of that accounting period alone. Other nonmilitary purchases, along with virtually all military purchases, are assigned to the current account (and included in government final consumption expenditure).

Treating government structures and equipment as investment requires that the current account include the value of the services that the capital assets provide. The value of these services covers depreciation (that is, the consumption, or using up, of fixed capital) and a net return on the capital assets. The NIPA treatment can be traced to the difficulty of estimating these services. In the business sector, the value of services rendered by capital is reflected in property incomes, including profit; profit is measured by subtracting the costs of production from the market value of output. Because government output is not normally sold on the market, this calculation cannot be made; the value of services provided by government capital must be imputed. Although BEA does not make this imputation for the NIPA's, it does estimate the depreciation on government assets; the depreciation estimates are part of its capital stock estimates, which include government structures and equipment.

In the SNA, only capital consumption is included as a measure of the value of the services of government assets. Further, the SNA does not provide for capital consumption on all government assets. Because of the practical difficulties of making the estimates, capital consumption is not provided for in the case of government assets such as roads, dams, breakwaters, or other forms of construction except structures. This treatment is rationalized by suggesting that outlays on repair and maintenance may be sufficient to maintain the assets in their original condition.

Thus, both the NIPA and SNA treatments are reflections of the practical difficulties of imputing the value of the services of government capital. Several approaches to such an imputation are available. One approach is to impute a value to the services of government assets on the basis of the market value of the services of similar private assets. The value of the services of government-owned office buildings, for example, might be imputed on the basis of rents actually earned by privately owned office buildings. (This procedure is used for the value of services of owner-occupied residential buildings.) For many government assets, however, close market analogies are not available. Another approach is a cost-based approach, in which the value of

the services is estimated as the sum of depreciation and an imputed value that is calculated by applying a rate of return—often a rate on an alternative investment—to the net stock of government assets. Several groups of U.S. researchers have applied variants of this approach, using BEA's depreciation and stock estimates. One of the problems encountered is in determining the appropriate rate of return to apply to the stock. This difficulty is suggested by the wide range found by a study that calculated four estimates using alternative assumptions about the rate. For 1979, the estimated value of the services of government capital in the United States ranged from $90.1 billion to $163.4 billion, and for the 1969–79 decade, the average annual changes in the four estimates ranged from 8.2 percent to 11.4 percent.[7]

Imputation for financial services.—Measuring the product of banking has been a continuing source of bedevilment to economic accountants. It is probably fair to say that no single solution to the problem enjoys much enthusiastic support. (Other depository institutions present similar problems. Historically the issue has been discussed under the rubric of the "banking" imputation, and terminology for that discussion is followed here for brevity.) Banks make explicit charges for some of the services that they render, but these charges are by no means the bulk of their income. The bulk of their income is from interest, dividends, and other property income. Because they pay much less interest than they receive, the application of standard economic accounting rules to banks leads to small or negative value added by the industry.

The view that has been taken in economic accounting is that banks make implicit charges for other services by paying out to depositors less interest than they earn in the form of interest, dividends, and other property income on deposited funds. The SNA and the NIPA's impute an estimate of this implicit charge and include it in the gross product of banking. The SNA and the NIPA's also impute an income payment and include it in net interest paid by banking. In principle, the imputations are equal to the difference between interest, dividends, and other property income received on depositors' finds and interest paid on depositors' funds.

The precise nature of the services for which the value is imputed is not clear, however. Some explanations refer to the services of liquidity provided by the financial institution. Others stress checking and bookkeeping services or safety. In the NIPA's, these services are assumed to be rendered to depositors; in the SNA, no explicit allocation is made.

In the NIPA's, the value of these services is allocated to the accounts of persons, government, business, and the rest of the world in proportion to the deposit balances of each sector. For persons and for government, expenditures are increased by the value of imputed bank service charges paid, and incomes are increased by the (identical) value of imputed interest received. The increased expenditures by these two sectors lead directly to increased GDP. For businesses that receive imputed interest, in contrast, the imputation has no effect on GDP: Net interest of these businesses declines by the amount of imputed interest received,

7. Frank D. Martin, J. Steven Landefeld, and Janice Peskin, "The Value of Services Provided by the Stock of Government-Owned Fixed Capital in the United States, 1946-79," *The Review of Income and Wealth, Series* 30 (September 1984): 346.

but the decline is offset by the (identical) value of imputed bank service charges paid. For the rest of the world, imputed bank service charges paid by the rest of the world are considered to be payments for exports of U.S. services, and higher exports lead directly to higher GDP. These higher exports are not offset by higher imports because imputed bank interest received by the rest of the world (**representing** payments for U.S. imports of capital) is a part of that sector's factor incomes, which are excluded from GDP.

The SNA does not allocate the imputation to specific sectors. Instead, the SNA treats the entire imputation as interest paid by banks to a dummy financial industry and as imputed service charges received by banks from the dummy industry. Value added by banks increases by the amount of the imputation, and value added by the dummy industry is negative in the same amount. As a result, GDP is not affected by the imputation.

Both the NIPA and the SNA imputations are open to criticism. Both are complex and difficult to explain and both assign a value to a service that is not clearly defined. In addition, the NIPA imputation may be criticized both for assuming that services are rendered only to depositors and for assuming that deposit balances (irrespective of the

turnover rates) are an appropriate indicator for allocating those services. The SNA imputation may be criticized for adopting the artificial device of a dummy industry.

Federal Government pensions.—In the NIPA's, the pension component of compensation of Federal Government employees is measured by the Federal Government's contributions to pension funds. In the SNA, this component is measured by the benefits paid by the pension fund.

To determine how to measure the pension component of employee compensation, the SNA asks two questions. First, is the pension plan **funded—that** is, does it maintain its assets separate from the employer's? Second, are the assets of the pension fund invested only in securities other than those of the employer? If the answer to either of these questions is "no"—and the answer to the second question is "no" for Federal Government pension funds, which invest primarily in U.S. Government securities—then the SNA does not regard the fund as separate from the employer. To portray the outlays actually made, the SNA measures the pension component of compensation by benefits paid.

In recent years, as benefits paid have exceeded employer contributions, the effect of Federal pensions has raised SNA-basis GDP relative to NIPA-basis GDP.

Differences that do not affect GDP

Some aspects of government activity are treated differently in the NIPA's and the SNA without, however, affecting GDP. Adjustments that affect components of GDP without affecting the total are identified as shifts from government to other sectors in table 6. (Table 6 also includes the other adjustments discussed so far.)

State and local government pension funds.—In the NIPA's, pension finds for State and local government employees are classified with government, and their administrative expenses are counted as government purchases of goods and services. In the SNA, however, these funds are classified along with private funds in the enterprise sector, and their administrative expenses are counted as private final consumption instead of government final consumption.[8] (The adjustment is labeled "Other" in the **personal/private** consumption expenditure reconciliation.) Likewise, saving of these finds is classified as household, instead of government, saving (see the section on differences in saving).

Some services provided by government for payment.— Goods and services provided by government to persons for payment fall into three general classes. The first two are treated similarly in the NIPA's and the SNA, but the third is treated **differently.**[9]

First, fees are charged for some services that are strictly governmental in nature. Examples include fees charged for **passports** and drivers licenses. Both the NIPA's and the SNA treat these transactions similarly; the fees do not represent private consumption in either framework—they are a form of nontax payment to government in the NIPA's and government fee in the SNA.

International Estimates of GNP and GDP

A short, annotated list of publications presenting GNP and GDP estimates for the United States and other countries follows. Secondary sources (such as the *Statistical Abstract of the United States)* are not included.

International Monetary Fund. ***International Financial Statistics Yearbook, 1989*** (annual). Washington, DC: International Monetary Fund, 1989. *GNP/GDP in local currencies for over 100 countries on an SNA basis. Monthly update,* ***International Financial Statistics,*** *presents current estimates.*

Organisation for Economic Co-operation and Development (OECD). ***National Accounts, Volume 1: Main Aggregates, 1960-1988*** and ***Volume 2: Detailed Tables, 1975-1987*** (annual). Paris: OECD, 1989. *For OECD countries on an SNA basis, volume 1 contains GDP in local currencies and in U.S. dollars (using both exchange rates and purchasing power parities) and volume 2 contains GDP and other measures in local currencies. Quarterly update,* ***Quarterly National Accounts,*** *presents current estimates, generally on an SNA basis; U.S. estimates on a NIPA basis adjusted by the OECD to put government purchases of structures and durables into investment.*

Statistical Office of the European Communities. ***National Accounts ESA-Aggregates, 1970-1987*** (annual). Luxembourg: Statistical Office of the European Communities, 1989. *GDP and various measures for the 12 members of the European Community plus the United States and Japan on the basis of the European System of Integrated Economic Accounts* ***(ESA).*** *Comparisons of GDP using both purchasing power parities and the European Currency Unit based on exchange rates.*

United Nations. ***National Accounts Statistics: Main Aggregates and Detailed Tables, 1986*** (annual). New York: United Nations, 1989. *GDP and other measures in local currencies for 165 countries or areas—the SNA basis for market economies and the System of Balances of the National Economy (MPS) basis for centrally planned economies. Includes summary descriptions of both the SNA and MPS.*

U.S. Central Intelligence Agency (CIA). ***Handbook of Economic Statistics, 1989*** (annual). Washington, DC: U.S. Government Printing Office, 1989. *World GNP, GNP/GDP, and per capita GNP/GDP in U.S. dollars for 50 countries. U.S. estimates on NIPA basis as published by BEA; other estimates by CIA using various sources.*

World Bank. ***The World Bank Atlas, 1989*** (annual). Washington, DC: World Bank, 1989. *GNP, total and per capita, in U.S. dollars (using exchange rates) for 151 countries on an SNA basis.*

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8. State and local government contributions to pension funds are counted as part of government compensation in the SNA, just as in the NIPA's.

9. For a discussion of the three classes in the NIPA's, see U.S. Department of Commerce, Bureau of Economic Analysis, *Government Transactions*, Methodology Paper Series MP-5 (Washington. DC: U.S. Government Printing Office. 1988): 5

Second, government enterprises provide goods and services that are very similar to those that are provided by private firms, and they charge prices that are designed to cover a substantial portion of the costs of providing the good or service. Examples include State liquor stores and the Tennessee Valley Authority. Purchases by households (and businesses) from such enterprises are treated no differently than purchases from private suppliers. Purchases by households enter the NIPA's and the SNA as private consumption purchases from the business sector.

Third, governments provide some services that are similar to services provided by nonprofit organizations. Examples include services of State universities, government recreational facilities, and public hospitals. In the NIPA's, charges for these services are treated as nontax payments and are not included in personal consumption expenditures. Instead, these services enter GDP as government purchases, valued at the cost to the government of providing the services. In the SNA, the charges paid are considered private consumption expenditure; the portion of the cost of providing these services that is not covered by consumer payments remains in government consumption expenditure.

U.S. military grant programs.—In the NIPA's, goods and services transferred by the U.S. Government to foreign countries are counted as government purchases. In the SNA, these transfers are counted as exports. One rationale for the NIPA treatment is that these transfers are made primarily to promote the security or other interests of the United States and are made at the discretion of the U.S. Government. (The adjustment is labeled "Other" in the exports reconciliation in table 6.)

Differences in types of income and in saving

Types of income.—The discussion of GNP and GDP so far has dealt with the product (or expenditures) components; summing these components is the approach to measuring GNP or GDP most used in the United States. Alternatively, gross product may be measured by summing value added across industries. For this approach, both the SNA and the NIPA's show compensation of employees, the consumption of fixed capital, and indirect taxes less subsidies as charges against gross product. However, the two systems differ in their presentation of the return to capital.

In the SNA, the production account's remaining component of value added, the operating surplus, is defined as the return to providers of all forms of capital. The disbursement of the operating surplus, along with other sources of income, is shown in the income and outlay accounts for the sectors and for the Nation. These accounts show both receipts and payments of property income (interest, dividends, and rent), of entrepreneurial income, and of miscellaneous income and transfers.

In the NIPA's, the production account for the Nation is combined with the income and outlay account for the business sector. As a result, instead of showing an aggregate return to capital, this account distinguishes corporate profits, proprietors' income, net interest, rental income of persons, operating surplus of government enterprises, and business transfer payments. Moreover, both the dividend component of corporate profits and interest are measured net of receipts of similar income.

Saving.—In both the SNA and the NIPA's, saving is derived as the difference between current receipts and outlays. Total saving, whether gross or net of capital consumption, is larger in the SNA than in the NIPA's, because, as previously discussed, the SNA treats government ex-

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Table 6.—Reconciliation of NIPA GNP Components to SNA GDP Components, 1988

[Billions of dollars]

Government purchases of goods and services, NIPA	968.9
Plus: Services of government capital—capital consumption allowances with CCAdj	57.5
Federal Government pensions	10.0
Less: Imputed financial service charges	5.9
Less shifts to other components:	
Government investment	88.8
Payments to government for personal services	57.1
Other	1.0
Equals: Government final consumption expenditure, SNA	883.7
Personal consumption expenditures, NIPA	3,235.1
Less: imputed financial service charges	91.1
Plus shifts from other components:	
Payments to government for personal services	57.1
Other	.9
Equals: Private final consumption expenditure, SNA	3,202.0
Gross private domestic investment NIPA	750.3
Plus shifts from other components: Government investment	88.8
Equals: Gross capital formation, SNA	839.0
Exports of goods and services, NIPA	547.7
Less: Factor income payments from the rest of the world	116.7
Imputed financial service charges	7.0
Plus shifts from other components: Other	.1
Equals: Exports of goods and services, SNA	424.0
Imports of goods and services, NIPA	621.3
Less: Factor income payments to the rest of the world	83.4
Equals: Imports of goods and services, SNA	537.9

NOTE.—SNA exports of goods and services are $7.0 billion lower than submitted to the international organizations. The difference is the result of a correction to the treatment of imputed exports of services of financial institutions.

CCAdj Capital consumption adjustment
GDP Gross domestic product
GNP Gross national product
NIPA National income and product accounts
SNA System of National Accounts

Table 7.—Reconciliation of NIPA Net Saving to SNA Net Saving, Total and by Sector, 1988

[Billions of dollars]

Total net saving, NIPA	128.8
Plus: Government investment	88.8
Less: Services of total government capital—government capital consumption allowances with CCAdj	75.9
Equals: Total net saving, SNA	141.7
Personal saving, NIPA	144.7
Plus: Estate and gift taxes paid	11.5
Plus shifts from other sectors:	
Shift of State and local government retirement funds from government to personal sector	68.1
Equals: Household saving, SNA	224.3
Corporate saving (undistributed corporate profits with IVA and CCAdj), NIPA	80.3
Plus: Income of Federal Government pensions from interest and employee contributions	7.5
Plus shifts from other sectors:	
Shift of net saving of government enterprises from government to business sector [1]	-12.0
Equals: Corporate and quasi-corporate enterprise saving, SNA	75.8
Government surplus or deficit(−), NIPA	-96.1
Plus: Government investment	88.8
Less: Services of total government capital—government capital consumption allowances with CCAdj	75.9
Estate and gift taxes received	11.5
Income of Federal Government enterprise pensions from interest and employee contributions	7.5
Less shifts to other sectors:	
Shift of State and local government retirement funds from government to personal sector	68.1
Shift of net saving of government enterprises from government to business sector	-12.0
Equals: General government saving, SNA	-158.4

1. Net saving of government enterprises is calculated as NIPA current surplus of government enterprises, less government enterprise capital consumption allowances with capital consumption adjustment, plus adjustment for Federal Government enterprise pensions.

CCAdj Capital consumption adjustment
IVA Inventory valuation adjustment
NIPA National income and product accounts
SNA System of National Accounts

penditures on nonmilitary structures and equipment as investment and includes the consumption of this capital in the current account, where it is included in government final consumption expenditure.

The allocation of saving among sectors also differs substantially between the SNA and the NIPA's. Table 7 shows a reconciliation of NIPA and SNA net saving by sector. The largest sectoral difference is in the treatment of State and local government pension finds; as mentioned earlier, in the NIPA's, the saving of these funds is included in government saving, and in the SNA, it is included in household saving. Because these funds are currently running a substantial surplus, the surplus in State and local government social insurance funds (and thus government saving) is lower, and personal saving is higher, in the SNA than in the NIPA's.

The table also shows two smaller differences. (1) In the NIPA's, estate and gift taxes are included in personal outlays and in government receipts and thus affect saving of the two sectors. In the SNA, they are treated as capital transfers and, therefore, do not affect saving. (2) In the NIPA's, government enterprises are given a mixed treatment in which some types of transactions are recorded as if they were part of the government sector and others as if they were part of the business sector.[10] In the SNA, public enterprises are included in the enterprise sector.

Differences in presentation

The extent of netting.—The SNA does not net offsetting transactions to the same extent as the NIPA's. For example, the SNA income and outlay account of the enterprise sector shows the receipt of dividends on one side of the account and the payment of dividends on the other. In contrast, the NIPA measure of corporate dividends is net dividends paid (that is, dividends paid less dividends received). Thus, enterprise income and total outlays in the SNA are larger than comparable NIPA measures (although this difference in treatment does not change sectoral saving).

Base year for constant-dollar estimates.—The base year for calculation of constant-dollar estimates in the international organizations' publications usually differs from that in BEA's publications. Currently, the U.N. publications show 1980 as the base year; the BEA publications shows 1982 as the base year. When BEA converts NIPA 1982-dollar estimates to SNA 1980-dollar estimates, the NIPA estimates are rebased at detailed expenditure levels. The year used for the base period affects the levels of constant-price GDP (and components) and the rates of growth calculated from them. Levels of constant-price GDP usually are higher with a later base period because inflation reduces the purchasing power of the unit of account—the dollar, for example—in which it is measured. The later base period also tends to result in lower rates of growth, reflecting the inverse relationship between price and quantity changes that generally prevails over long timespans.

Part 3. The Revision of the SNA

The revision of the SNA currently underway is based on a worldwide review of progress in economic accounting over the last 20 years and of the needs for domestic and cross-country analysis and policy formulation. This part first describes the revision process. Next, it describes some of the recommendations for revision. It illustrates the definitional and classificational revisions with those that relate to the issues discussed in part 2, and it summarizes some of the revisions to the accounting structure that highlight the comprehensiveness of the SNA and its flexibility. Finally, this part discusses the unresolved issues relating to the definition of investment and environmental accounting.

Goals and organization of the revision

Early in the process, it was decided that the revision would not make major conceptual changes or extensions. Instead, the revision would update the SNA, clarify and simplify its presentation, and harmonize the SNA with other international guidelines. The goal of updating the SNA was to reflect new economic institutions, statistical developments, and new analytical applications. For example, the SNA does not deal with the value added tax, which is now widely used in Europe and which poses difficulties for economic accounting. The goal of clarifying reflects a widely felt need for a publication describing the system that is easier to understand, and **simplifying** has come to be interpreted as the need for a series of handbooks to explain how the system could be put into practice. The harmonizing is to be with the guidelines for the System of Balances of the National Economy, other international statistical systems (such as the *Balance of Payments Manual* and *A Manual on Government Finance Statistics* prepared by the International Monetary Fund), and international classification systems (such as the International Standard Industrial Classification of all Economic Activities and the Classification of the Functions of Government).

The process has been planned and **funded** by the United Nations, the Organisation for Economic Co-operation and Development, the Statistical Office of the European Communities, the International Monetary Fund, and the World Bank. These organizations, operating through an Inter-Secretariat Working Group, arranged a series of eight topical "expert group" meetings beginning in 1986. These meetings reviewed issues and made recommendations for revision. The participants reflected the balancing of several perspectives—producers of economic accounts and users, economic accounting generalists and specialists, national statistical offices and international organizations. Five "core" experts participated in all meetings to provide continuity. Beginning in January 1989, the core experts were supplemented by six other experts to become the "coordinating group." This group will make recommendations on unresolved issues, review drafts, and otherwise see the revision through to the end. U.N. consultants—a primary author and several others doing selected parts—are preparing a draft of the revised SNA manual. The drafting is largely based on the recommendations made in the expert group meetings.

As of mid-1990, a provisional draft of the revised SNA manual and a discussion paper prepared by the Inter-Secretariat Working Group are being circulated to national

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10. For a discussion of the treatment of government enterprises in the NIPA's, see U.S. Department of Commerce, Bureau of Economic Analysis, *Government Transactions,* Methodology Paper Series MP-5 (Washington, DC: U.S. Government Printing Office, 1988): 8-8.

Information About the SNA Revision

The SNA revision process has been extensively documented. Background papers were prepared for each of the expert group meetings, a summary set of conclusions was agreed upon by each expert group, and a full report of each meeting was prepared. For a copy of the summary paper "System of National Accounts (SNA) Review Issues," prepared for the 1990 U.N. regional commission meetings, write Mr. Jan van Tongeren, National Accounts and Special Projects Branch, United Nations Statistical Office, United Nations, New York, NY 10017.

The Conference on Research in Income and Wealth, affiliated with the National Bureau of Economic Research, is planning a workshop on the SNA revision. This workshop, scheduled for November 1990, will be a forum for comment.

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statistical offices and will be discussed in meetings of the U.N. regional commissions. A final draft of the revised manual, reflecting comments on the provisional draft and discussions in the coordination group, is to be submitted to the U.N. Statistical Commission for approval in early 1993. (See the accompanying box for information about documentation of the revision process and the status of the recommendations.)

Recommendations for revision

The recommendations—which include several hundred individual points—range from conceptual issues to specific treatments. Despite the diversity, several themes have emerged; they include improving the integration of flows and stocks, adapting the accounts to portray economies experiencing inflation, improving the measurement of the household sector, and updating the treatment of financial institutions and transactions.

Several of these recommendations are related to issues discussed in part 2, and they will serve to illustrate the kinds of definitional and classificational revisions being considered.

- Reintroduce GNP as one of the family of aggregates. However, because GNP is derived by adding net factor income from the rest of the world to GDP, it would be considered an income aggregate rather than a value added aggregate (and it may be renamed gross national income).
- Eliminate for government employee pension finds the criterion of classification regarding the investment of funds in the employer's own securities. (If the pension fund invested only in the employer's securities, it was classified in the sector of the employer.) Thus, government employee pension funds that have been classified in the government sector could be classified with other pension funds in the enterprise sector.
- Broaden the definition of government capital formation to include expenditure on goods purchased for the military when the expenditure would be capital formation if made by others. Continue to treat as current expenditure only expenditure on goods used solely as weapons and means of delivering weapons.
- Introduce the calculation of capital consumption for government assets such as roads, dams, and breakwaters.
- Retain the calculation of the imputed bank service charge as property income received by financial in-

termediaries less interest paid and, instead of using the device of a dummy industry, allocate the service charge—to be renamed the imputed service charge for financial intermediation—among final consumption of government and households, exports and imports, and intermediate consumption of industry. The allocation is to be based on the difference between (1) interest flows actually paid on deposits and received on loans and (2) corresponding interest flows calculated with a central "reference" rate (such as an interbank loan rate or a prime rate). This approach to allocation recognizes that different uses are accorded differing amounts of service, reflecting the spread between the actual interest rate paid or received and the reference rate.

- Introduce imputed rent on buildings owned and occupied by government. (As yet, however, the recommendation has not been supplemented with an approach to implementing it.)

The recommendations for the accounting structure are not independent of the recommendations for the definitions and classifications; by and large, the accounting structure can be viewed as implementing the specific definitional and classificational recommendations. Overall, the accounting structure is seen as having four parts: (1) A central framework, which consists of a hierarchial structure of classifications, sets of accounts, and sets of tables that together, as a closed and articulated system, define the SNA; (2) alternative matrix presentations, which are conversions of the accounts in the central framework; (3) supplementary analyses, including satellite accounts; and (4) links with other systems of statistics.

The recommendations for two parts of the structure will serve to illustrate important characteristics of the revised system.

The sequence of accounts and the goods and services accounts.—Within the central framework, the core of the system is the "sequence of accounts" (table 8). This set of accounts is pedagogical in intent, rather than for publication of estimates. It demonstrates the comprehensive, integrated structure that is being recommended: All transactions are recorded in it, and, in principle, the sequence can be applied to all sectors (and subsectors) as well as to the Nation.[11] A shortened sequence, accounts I and II.1.1, is to be applied to industries.

The full sequence is an elaboration and refinement of the set of accounts in the present SNA. (The production and the income and outlay accounts shown in table 2 correspond to accounts I and II in table 8; the capital accumulation, capital finance, and revaluation accounts in table 2 correspond to accounts III.) The elaboration and refinement is particularly noteworthy for the "distribution and use of income accounts" and the "other changes in assets accounts."

The elaboration of the income accounts (accounts II) is designed to improve the portrayal of the process of distributing and redistributing income by separating it into steps. As the first step, the "primary distribution of income accounts" show how value added, from the production

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11. However, not all transactions are relevant for all sectors, and, similarly, not all accounts are relevant for all sectors. For example, the use of income account, account II.4 in table 8, is relevant for the sectors that engage in final consumption expenditure, but not for the enterprise sectors, which do not engage in final consumption expenditure.

Table 8.—Sequence of Accounts Proposed for the Revised SNA

Account	Balancing item	Main aggregate
I. Production account	Value added	Domestic product
II. Distribution and use of income accounts:		
1. Primary distribution of income accounts:		
1. Generation of income account	Operating surplus/mixed income	
2. Appropriation of primary income account	Primary income	
1. Entrepreneurial income account	Entrepreneurial income	
2. Appropriation of other primary income account	Primary income	National income
2. Secondary distribution of income account	Disposable income	National disposable income
3. Redistribution of income in kind account	Adjusted disposable income	
4. Use of income account:		
1. Use of disposable income account	Saving	National saving
2. Use of adjusted disposable income account	Saving	
III. Accumulation accounts:		
1. Capital account	Net lending/net borrowing	
2. Financial account	Net lending/net borrowing	
3. Other changes in assets accounts:		
1. Other changes in the volume of assets account	Changes in net worth from other changes in the volume of assets.	
2. Revaluation account	Changes in net worth from changes in actual prices	
1. Neutral revaluation	Changes in net worth from changes in the general price level.	
1. Real holding gains/losses	Changes in real net worth from changes in relative prices.	
IV. Balance sheets:		
1. Balance sheet, opening	Net worth	National wealth
2. Change in balance sheet	Changes in net worth	Changes in national wealth
3. Balance sheet, closing	Net worth	National wealth

SNA System of National Accounts

account, is distributed to labor and capital as factors of production and to government. Second, the "secondary distribution of income account" brings in cash income flows not related to production; disposable income is the balancing item. Third, the "redistribution of income in kind account" brings in social benefits in kind and the value of services, such as education, provided by government and nonprofit institutions to individual households; the balancing item is adjusted disposable income. For the use of income, two subaccounts correspond to the two measures of disposable income; they record corresponding measures of consumption—that is, without and with the social benefits in kind—so that they show the same measure of saving as their balancing items. (The introduction of measures of income and consumption that include the value of services provided by government and nonprofit institutions to individual households is one of the major proposed revisions.)

The elaboration of the "other changes in assets accounts" (accounts III.3) is central to the better integration of flows and stocks and to the analysis of inflation. These accounts cover changes other than those from saving and voluntary transfers of wealth; they cover (1) discovery or depletion of subsoil assets, destruction by war, natural disasters, etc., and (2) changes in the general price level and in relative prices. The latter is in the revaluation account, which shows the changes in net worth from changes in the actual prices of assets and liabilities. These nominal holding gains/losses are then separated into two parts. Changes in net worth from changes in the general price level—neutral revaluations— are obtained by applying an index of the general price level to the opening value of all assets and liabilities. Changes in net worth from changes in relative

prices—that is, real holding gains/losses—are obtained as the difference between nominal holding gains/losses and neutral revaluations.

The central framework also includes a "goods and services account," the key account in a set of accounts that are called transactions accounts. This account records for the Nation the total resources (output and imports) and total uses (intermediate consumption, final consumption, changes in stocks, gross fixed capital formation, and exports) of goods and services. It is balanced globally—that is, there is a balance between all resources and all uses. (In contrast, the other transactions accounts, which present total resources and total uses for a particular kind of transaction, balance for each kind of transaction.) Thus, the goods and services account summarizes the information in the accounts for the sectors to yield a measure of national expenditure.

Satellite accounts.—One of the general recommendations is to emphasize "flexibility" in the application of the SNA, thus recognizing the diversity of the world's economies and statistical systems. Satellite accounts are one of two major kinds of supplementary analyses designed to implement this emphasis. (The other is the flexible application of the central framework—for example, by using the hierarchy of the central classification to provide more or less detail or by using a complementary classification.)

A satellite account's basic element of flexibility is that it can use definitions differing from those in the central framework as long as they are consistent within the satellite account. Satellite accounts can add information about a particular aspect of the economy to that in the central framework; in particular, they can seek to integrate mon-

etary and physical data. They can arrange information differently—for example, they can cut across sectors to assemble information on both intermediate and final consumption. They can use a classification other than the primary one used in the central framework—for example, they can identify expenditure on "research in education" as part of expenditure on research even if it is included in expenditure on education in the central framework.

The recommendation to include satellite accounts builds on the experiences of several countries that have constructed satellite accounts, largely on an ad hoc basis, for such fields as health, education, agriculture, research and development, and the environment. The draft SNA manual includes a chapter that provides a general framework and demonstrates how that framework might be used for some of the fields in which satellite accounts would be most useful.

Outstanding issues

In several areas, final recommendations have not yet been made. One of the areas deals with the extension of the concept of investment, now essentially limited to outlays on structure and equipment, to include outlays on research and development (R&D), mineral exploration, computer software, and intellectual property such as films and sound recordings.

The discussion about treating R&D as investment is illustrative. The arguments for the change referred to R&D's kinship with outlays on capital assets in that the purpose of both is to generate income in future periods. Updating the definition of capital formation was called for in light of studies that showed that R&D outlays (and some other outlays on intangible assets) were important in explaining economic growth. Several unofficial sets of accounts, including those by Robert Eisner and John W. Kendrick for the United States, have already included R&D as capital; a number of the countries where R&D outlays are sizable have experience with data collection using the guidelines drawn up by the Organisation for Economic Co-operation and Development.

The arguments against the change centered on (1) the high degree of uncertainty of return, which is one of the reasons given in the SNA to explain the present convention; (2) the major break in continuity of time series in the countries where most the world's R&D is conducted (the change would raise GDP by 1 to 2 percent); (3) the practical difficulties of calculating capital consumption and constant-price estimates; and (4) the difficulty of identifying the asset created by R&D outlays. Further, the conceptual basis for including R&D outlays but not some other outlays—such as on education and on literary and artistic work (for example, films and sound recordings)—was questioned. Initially, the recommendation had been to include R&D outlays as investment. Recently, an additional difficulty has come to light: The guidelines for balance sheets include patents (once purchased and sold), so including both what might be called R&D assets and patents would lead to double-counting. Thus, the earlier recommendation is being reviewed.

The treatment to be given natural resources and the environment in the revised SNA is another area in which final recommendations have not yet been made. The SNA is criticized because GDP, as now measured, is seen as flawed in the way it treats environmental protection costs and the degradation and depletion of natural resources. Adjustments for "defensive expenditures" to restore and protect the environment and for depletion and degradation of natural resources are called for; only with the adjustments, it is argued, will a country know the maximum amount that can be consumed without causing impoverishment in the long run.

Especially since the early 1980's, international organizations have made a substantial effort to develop environmental accounting. So far, there has not been agreement on a recommendation to include any of the suggested frameworks for environmental accounting in the new manual. The argument that has prevailed is that too many questions of identifying, defining, and measuring environmental issues are as yet unresolved. Instead, the recommendation so far is that the new manual should stress that GDP is not a measure of welfare and that care should be taken in interpreting the accounts. More specifically, the new manual is to discuss the interpretation of the main aggregates, such as GDP, in relation to environmental degradation, depletion, and defensive expenditures.

However, it is acknowledged that interest in environmental accounting is growing. Concurrently, work in environmental accounting continues, and the field may have progressed substantially by the time the new manual is near completion. Two issues remain unresolved. What balance should the new SNA manual strike in describing the strengths and weaknesses of GDP? Can and should a framework for environmental accounting, including an adjusted measure of GDP, be featured in introducing and explaining satellite accounts?